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October 12, 1971

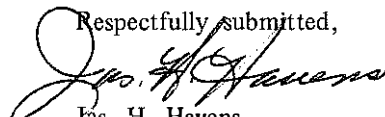
H-3-18

MEMORANDUM TO: J. R. Harbison
State Highway Engineer
Chairman, Research Committee

SUBJECT: Research Report; Final Evaluation of Grooved Centerlines;
I-71- 2(15)37; HPR - 1(6), Part III, KYP - 18; Experimental.

The report enclosed herewith succeeds one, dated October 1969, which described the effectuation of this experimental project. This issuance of this report was delayed because of our inability to make satisfactory photographs of the centerlines during rainy, nighttime conditions--that is, to illustrate a driver's view and the comparative brightness of the grooved and ungrooved lines. Inasmuch as the purpose of the grooving was to enhance drainage of water from the lane-marking paint and to, thereby, improve reflex-reflection (brightness, visibility, etc.), it seemed essential to this report to document photographically any improvements realized. Figure 6 was obtained very recently. If such a photograph had been obtained during 1970, we might have discontinued observations and thereby failed to take due notice of the decreased durability of paint on the grooved stripes.

No subsequent reporting is planned. Other innovations for improving visibility will be explored.

Respectfully submitted,

Jas. H. Havens
Director of Research

Enclosure
cc's: Research Committee

Research Report
314

**GROOVING PAVEMENT CENTERLINES
FOR LANE DEMARCATION**

Final Performance Report
KYP 18

by

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Division of Research
DEPARTMENT OF HIGHWAYS
Commonwealth of Kentucky

October 1971

INTRODUCTION

In late June 1969, the Kentucky Department of Highways contracted to have experimental, longitudinal centerline grooves, 15 feet long at 80-foot intervals, cut into both sets of dual lanes of a 2.7-mile portion of I 71 in Carroll County. When the centerline was painted in an otherwise normal way, the skip lines were alternately on grooved and ungrooved surfaces. The roadway was opened to traffic on July 15, 1969. An interim performance report* contained detailed information on the test site, grooving procedures, groove configuration, initial striping efforts, and preliminary evaluations of the relative effectiveness of the grooved stripe. The purposes of this report are: 1) to update the observations cited in the interim report, 2) to evaluate the grooved centerlines during rainy, nighttime conditions, and 3) to record wear and durability histories of grooved and ungrooved lines.

*Hughes, R. D. and Garner, G. R., *Grooving Pavement Centerlines for Lane Demarcation*, Division of Research, Kentucky Department of Highways, October 1969.

OBSERVATIONS PRIOR TO RESTRIPING

On the night of April 1, 1970, or after nine months of traffic wear, an unusually heavy rainfall occurred at the test site. The grooved stripes were observed to be definitely superior in delineating the roadway centerline. The ungrooved stripes were faintly visible. It was also observed that water drained sufficiently well from the troughs of the grooves. No nighttime or daytime dry-weather observations were performed at that time. No photos were made.

OBSERVATIONS AFTER RESTRIPING

During the summer of 1970, the entire project was restriped. In general, the second striping corresponded with the first with respect to placement and coverage.

Late in 1970, six months after the first repainting, the grooves appeared clean and in good condition. At nighttime and when dry, the grooved stripes were slightly less reflective than the ungrooved stripes.

During the early summer of 1971, a year after the first repainting, the stripes were again inspected. In general, the grooved stripes showed much more wear and (or) loss of paint than the ungrooved stripes (Figures 1, 2, and 3). Therefore, during dry, daytime and wet, daytime conditions, the grooved stripes were less visible

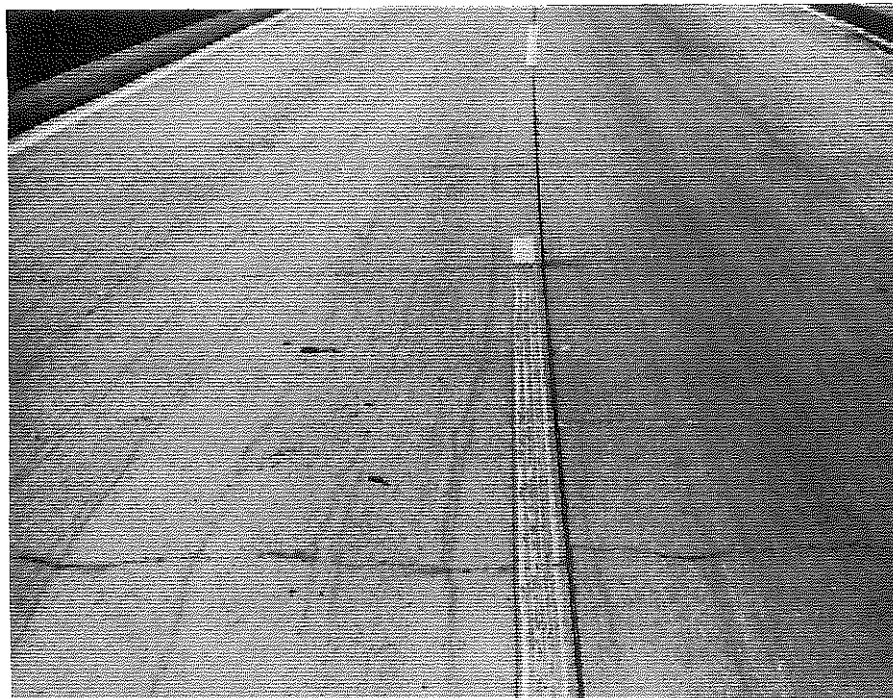
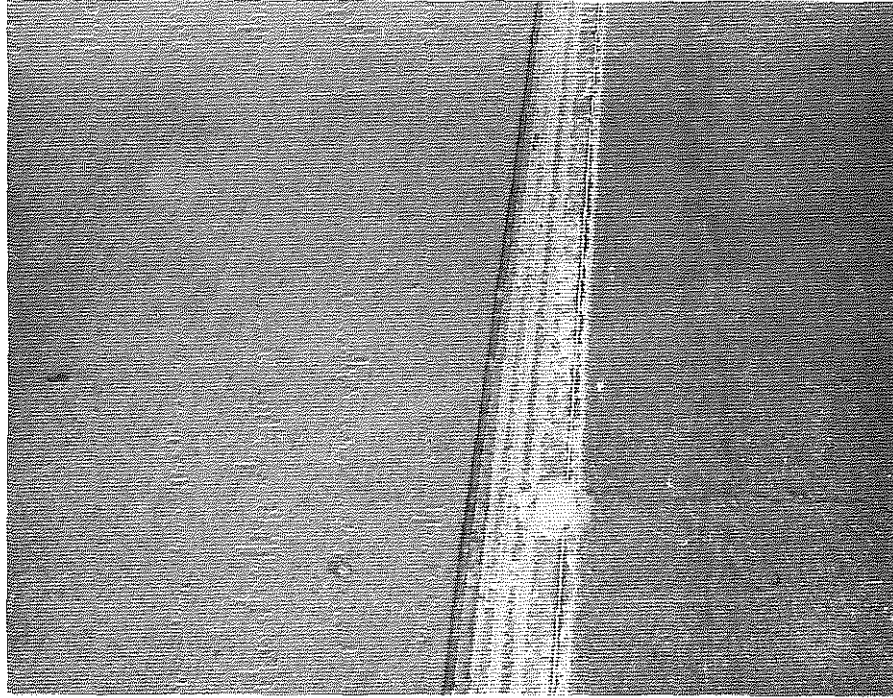


Figure 1. Differences in Wear between Grooved and Ungrooved Stripes. Notice overlap of paint onto ungrooved surface. (June 1971)



**Figure 2. Loss of Paint from Grooved Centerline
One Year after Repainting. (June 1971)**

than the ungrooved stripes. Intensified wear and (or) chipping caused premature loss of paint on the ridges (lands). Figure 1 shows paint lapped onto an ungrooved surface and an ungrooved line in the background (see Figure 5 also).

The project was restriped again in July 1971. Several attempts have been made to obtain high-quality photos of lines during rainy night conditions. Figure 6 was obtained in October 1971.

CONCLUSION

When first painted, the visibility of the stripes was equal to or better than the ungrooved stripes under all weather conditions. However, after a year of wear, the grooved stripes were better only during wet, nighttime conditions. For all other viewing conditions, grooved centerlines appear worn and would therefore require more frequent painting than ungrooved centerlines.

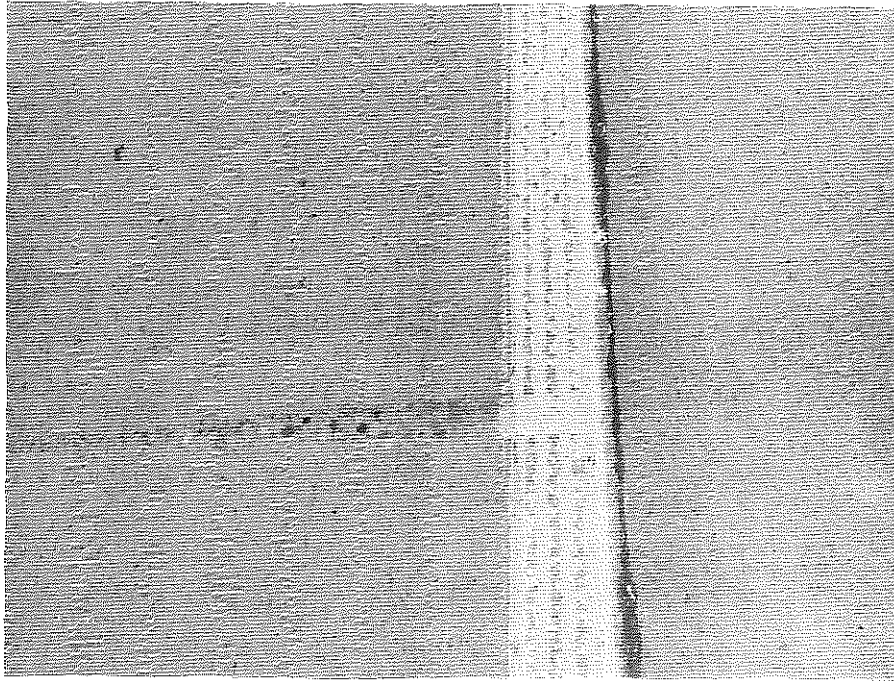


Figure 3. Loss of Paint Is Most Significant on Ridges (Lands) of Grooved Centerline. (June 1971)

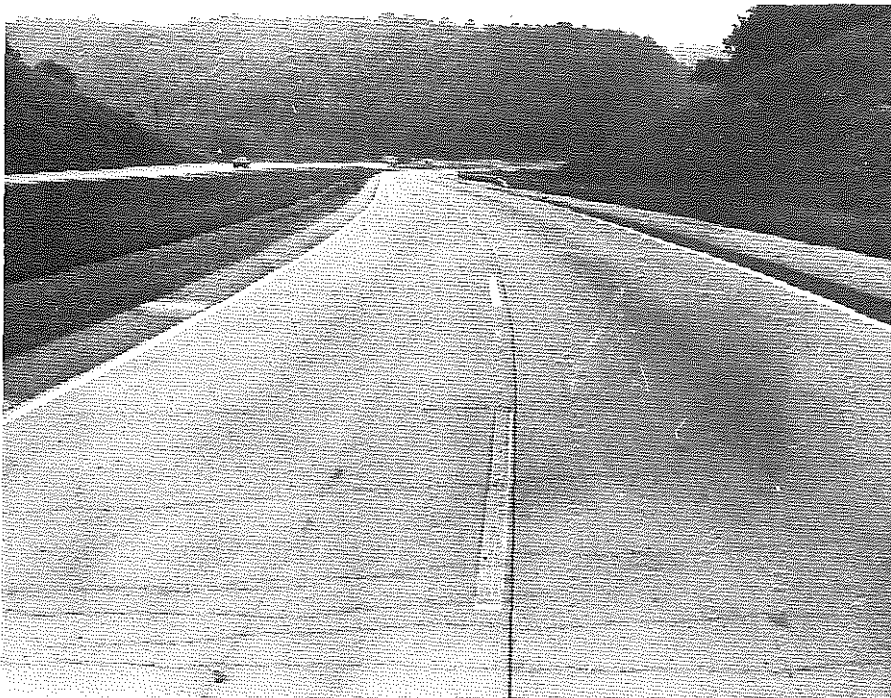


Figure 4. Appearance of Centerlines during Dry, Daytime Conditions One Year after Repainting. (June 1971)



**Figure 5. Appearance of Centerlines during Wet,
Daytime Conditions. (June 1971)**

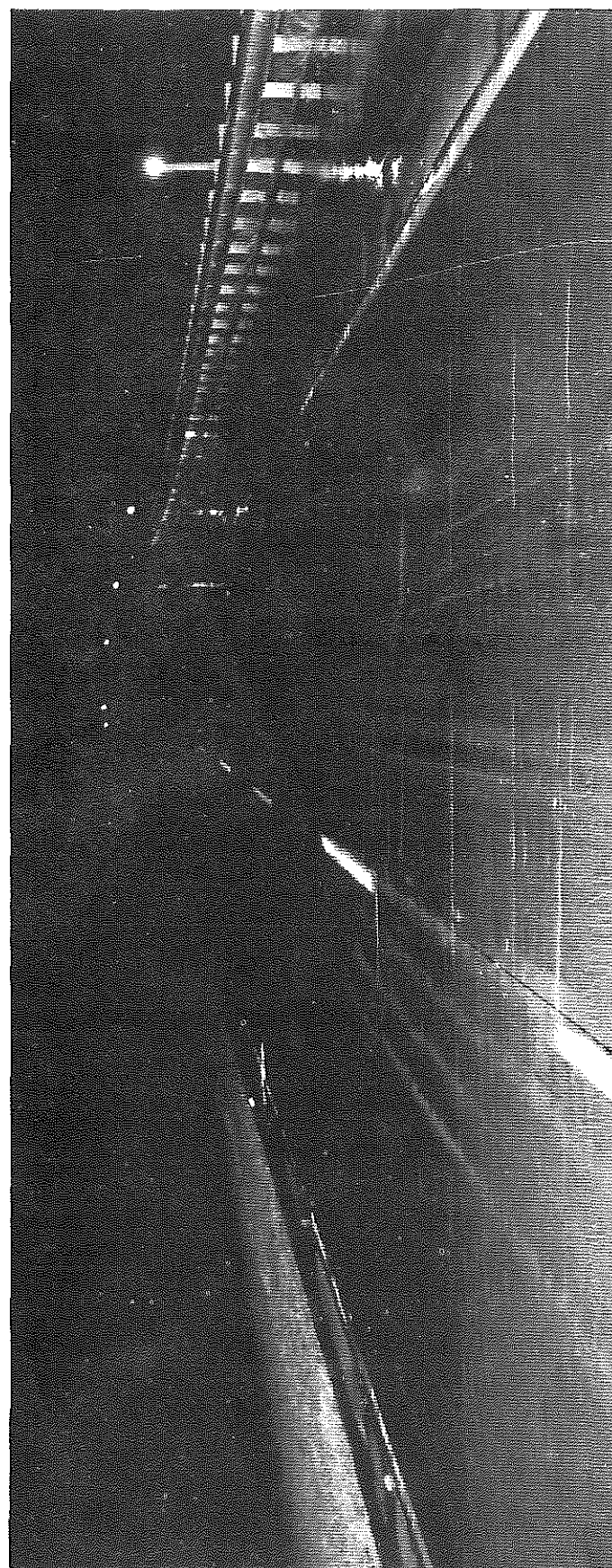


Figure 6. Appearance of Lines during Rainy, Nighttime Conditions after Second Repainting. (October 1971)